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Generalization of the coordinates non-commutativity to a general manifold

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Abstract

In the framework of quantum mechanics and based on the non-commutativity between the coordinates in Minkowski space-time, we generalize the geometric non-commutative relation to a space-time other than Minkowski. Using the authority of inserting the unit operator, we exploit the translation operator to derive the Wyle-Moyal star product operator. Up to the first order of translation parameters and by employing the Wyle-Moyal star operator, we find the modified non-commutativity of coordinates relation in terms of geometric structure. The basic premise of this article is that pseudo-Riemannian local homomorphic with Minkowski space-time are equivalent.

Keywords: non-commutativity geometry, quantum mechanics, translation operator, Wyle – Moyal star product, locally homomorphism

For full article, refer to the Persian section